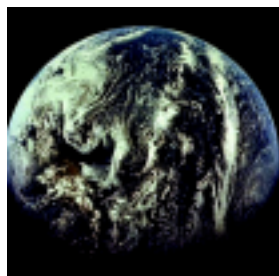




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Superfund: 20 YEARS OF PROTECTING HUMAN HEALTH AND THE ENVIRONMENT



Superfund: **20 YEARS OF PROTECTING HUMAN HEALTH AND THE ENVIRONMENT**

On December 11, 1980, Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund).

This important legislation was enacted to fill a major gap in environmental protection. The events at Love Canal, New York, and other sites around the country had shown that wastes buried long ago – and mostly forgotten – could prove to be a serious threat to the community.

The Superfund legislation provided strong Federal authorities to address this problem, but it was up to the U.S. Environmental Protection Agency (EPA) to create an effective Superfund program. At first, EPA faced a series of unknowns. There was a lack of data about specific sites and the health effects of chemicals. Technologies had to be created and a regulatory structure needed to be put in place. Over time, a strong and effective program evolved – the result of ongoing reform and revitalization.

Today, EPA is working continuously to: increase community participation and public/private partnerships; enhance cleanup effectiveness and consistency in program implementation; streamline the enforcement process and optimize fairness; and encourage economic redevelopment. According to a report published in June 2000 by the National Academy of Public Administrators, the reforms have “successfully addressed the key challenges facing Superfund” and made the program faster, fairer, and more efficient.

Working together with States, Tribes, communities, local governments, and many other stakeholders, Superfund has produced impressive results. On its 20th anniversary, Superfund can point to many accomplishments, including:

- Over 6,400 actions to immediately reduce threats to public health and the environment.
- 757 Superfund sites with all cleanup construction completed.
- Cleanup work done by responsible parties at over 70 percent of the sites that EPA has placed on its list of national priorities.
- Private parties settlements at a value of over \$18 billion.

While Superfund’s accomplishments are impressive, challenges remain. Abandoned waste sites are still being discovered. EPA continues to work with its partners to address immediate, or long-term, dangers – and ensure that the remedies selected remain effective for years to come. EPA also serves as a catalyst to promote redevelopment in areas that were once considered “lost” because of contamination.

At the start of its third decade, a strong Superfund program will continue to meet the challenge of protecting human health and the environment from the dangers of hazardous waste.

CONTINUING THE PROMISE OF EARTH DAY

MAJOR EVENTS BEFORE EARTH DAY THAT RAISED ENVIRONMENTAL CONSCIOUSNESS

1962

Rachel Carson's book, *Silent Spring*, alerts the general public to the hidden dangers associated with pesticide use. *Silent Spring* becomes a cornerstone of the environmental movement, highlighting the causal relationship between human action and adverse changes to human health and the environment.

1968

Apollo 8 transmits the first images of the Earth as a luminous blue sphere in the otherwise dark void of outer space. The images of our planet from the Apollo moon missions give rise to feelings that our Earth's environment is something fragile and precious that must be protected – providing inspiration to a nascent environmental movement.

1969

An explosion on an oil platform six miles off the coast of Santa Barbara, California, spills 200,000 gallons of crude oil – creating an 800-mile oil slick that mars 35 miles of the California coast. Incoming tides wash the corpses of dead seals and dolphins on shore; nearly 3,700 birds are estimated to have died.

In Cleveland, Ohio, the Cuyahoga River catches fire and burns due to chemical contamination. This event galvanizes growing public concerns about the threats of unregulated toxic chemical use and disposal.

1970

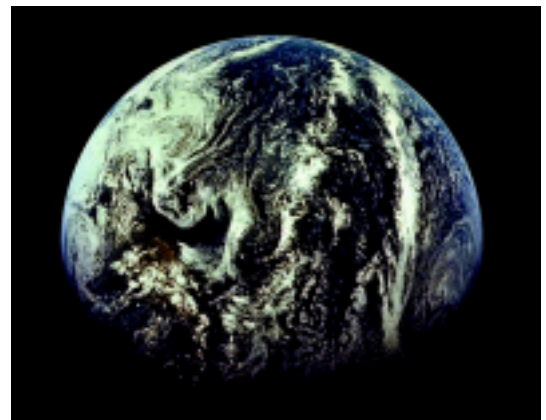
The National Environmental Policy Act of 1969 (NEPA) is signed into law by President Richard Nixon on January 1, 1970. Heralded as the *Magna Carta* of the country's environmental movement, NEPA established a framework for the Federal government to assess the environmental effects of its major decisions.

Membership in the Sierra Club grows from 15,000 in 1960 to 113,000 in 1970 – an increase of more than 700 percent. The National Audubon Society also sees its membership grow significantly during the decade – from 32,000 in 1960 to 148,000 in 1970.

Earth Day (April 22, 1970) — For years, environmental contamination was largely seen as the inevitable (and accepted) consequence of economic progress. As cities grew and industries flourished, toxic emissions polluted the air and wastes were dumped into waterways or buried in the ground.

In the 1960s, Americans grew increasingly concerned about squandering what once seemed like the country's limitless resources. The word "environment" entered the American political vocabulary as a larger concept beyond simply preserving wilderness areas or regulating the most obvious forms of pollution. Widespread media coverage of disasters like the Santa Barbara oil spill and the Cuyahoga River fire gave rise to a popular concern that the environment was threatened by human activities and in need of protection. Nothing better demonstrated this growing wave of public awareness than the tremendous national response to the first Earth Day.

When Senator Gaylord Nelson (D-Wisconsin) called for a nationwide "Environmental Teach-in," he was thinking mainly of raising environmental consciousness on the nation's college campuses. But news of the idea set off what Nelson later called "a



Earth as seen by the Apollo astronauts

"It worked because of the spontaneous, enthusiastic response at the grassroots. Nothing like it had ever happened before. While our organizing on college campuses was very well done, the thousands of events in our schools and our communities were self-generated at the local level . . . They simply organized themselves. That was the remarkable thing that became Earth Day."

Senator Gaylord Nelson
Founder of the First Earth Day
at the 25th Celebration

truly astonishing grassroots explosion." More than 20 million people from all parts of the country participated in the first Earth Day. Events were held in 10,000 schools, 2,000 colleges, and over 1,000 communities.

New Protections and Newly Discovered Threats

Also remarkable is what happened in the years following Earth Day. President Richard Nixon established the U.S. Environmental Protection Agency (EPA) eight months later. Congress passed a series of laws that regulated the introduction of pollutants into the nation's air and waterways, controlled the production of pesticides and other toxic substances, and required "cradle-to-grave" tracking of hazardous waste.

The 1970s have been called the "golden age" of environmentalism in the United States, but it was also a time when the nation first became aware of a serious threat to human health and the environment.



Love Canal, New York (August 7, 1978) — President Jimmy Carter declares a State of Emergency, freeing Federal funds to move residents from this Niagara Falls community built over and around a former landfill. In the 1940s and 1950s, the landfill had been a dumping ground for tons of chemical wastes, but the landfill had been closed and covered in 1953. Through the 1960s, and increasingly in the 1970s, residents reported odors and incidents of chemical residues seeping into their basements and lawns. Later studies indicated that chemicals from the landfill had risen up along with the water table to contaminate surrounding land, as well as sewers, creeks, and the Niagara River. This contamination coincided with increased local cases of miscarriages, birth defects, respiratory ailments, and cancer. For example, a survey conducted by the Love Canal Homeowners Association found that 56% of the children born from 1974-1978 had a birth defect.

An Unexpected By-product of the Industrial Age

Love Canal graphically presented the nation with a problem that had been largely ignored for a number of decades.

By the middle of the 20th century, U.S. industry and American consumers had come to expect products and processes that required the manufacturing of complex chemicals. A booming economy produced an ever-expanding selection of synthetic fibers, plastics, fuels, fertilizers, drugs, and pesticides.

Industry concentrated on the production of these goods – not on developing technologies to safely dispose of the wastes. Too often, chemical residues were simply burned into the air or discharged into the oceans, waterways, or municipal sewers. The foul air and water that resulted from these practices helped to inspire the first Earth Day – and the worst excesses were addressed by early environmental legislation. Laws like the Clean Air Act, the Clean Water Act, and the Safe Drinking Water Act regulated the introduction of new pollutants into the nation’s air and water.

Since the beginning of the Industrial Revolution, the tried and true method of disposing waste was simply to hide it away, usually by burying it in the ground. This same solution was applied in the 20th century. However, now the chemicals had become more complex and the by-products much more dangerous and persistent. Following the old strategy of “out of sight–out of mind,” these new types of hazardous wastes were pumped into drums or tank cars – and then dumped into unused corners of plants, trenches, or landfills. This is what occurred at Love Canal – beginning a chain of events that brought the dangers of hazardous waste sites into national prominence.

Tragic Consequences at Love Canal

At Love Canal, over 21,000 tons of chemical wastes were deposited in a landfill. The landfill closed in 1952, and was then covered over the next year. Over time, a community grew around the abandoned landfill. Under the old scenario of “out of sight–out of mind,” that should have been the end of the story.

However, more than two decades later, increasing numbers of Love Canal residents began complaining of health problems, including chronic headaches, respiratory discomforts, and skin ailments. Residents also noticed high incidents of cancer and deafness. The State of New York investigated and found high levels of chemical contaminants in the soil and air – with a high incidence of birth defects and miscarriages in the immediate area around the Love Canal landfill. President Jimmy Carter declared a State of Emergency in 1978, and Federal funds were used to permanently relocate 239 families in the first two rows of houses that encircled the landfill area.

But the tragedy did not end. A New York State investigation found “extensive migration of potentially toxic materials outside the immediate canal area.” In 1979, 300 additional families in a 10-block area around the site were relocated because of health problems from chemical exposure. In 1980, EPA announced the results of blood tests that showed chromosome damage in Love Canal residents. Residents were told that this



Love Canal resident protests toxic dangers

could mean an increased risk of cancer, reproductive problems, and genetic damage. Later that year, President Carter issued a second State of Emergency – providing funding for the permanent relocation of all 900 residents of the Love Canal area.

Early Attempts to Deal with Toxic Chemicals

Six years after Earth Day, Congress acted to address the threat from these new chemicals and their introduction into the environment. The Toxic Substances Control Act (TSCA) established methods for identifying chemicals that could pose risks to humans, plants, and animals – and placed controls on their manufacture, distribution, use, and disposal. The Resource Conservation and Recovery Act (RCRA) provided a framework for ensuring the safe disposal of wastes that threaten human health or the environment because they are flammable, explosive, corrosive, or toxic. RCRA required that such “hazardous wastes” be tightly managed from generation to disposal.

TSCA and RCRA addressed the new threats posed by industrial practices developed during the 20th century. Together, they empowered EPA to establish a regulatory scheme to provide protections from the introduction of dangerous chemicals and chemical by-products into the environment.

But Love Canal exposed a gap in this new blanket of protection. Toxic chemicals did not need to be newly introduced to provide a threat to a community. Wastes that had been buried long ago – and mostly forgotten – could suddenly prove to be dangerous.

A new threat to human health and the environment was discovered in the decade after Earth Day. And new ways needed to be developed to address this serious challenge.



Evacuation at Love Canal



Environmental awareness on Earth Day

THE BIRTH OF SUPERFUND

TOXIC WASTE THREATS AROUND THE COUNTRY

BRIDGEPORT, NEW JERSEY (1977) – Sparks from a welder's torch ignite an accumulation of chemicals, including benzene, toluene, and PCBs, at a waste storage facility. A raging fire sends up a torrent of thick black smoke resembling a tornado. Six die and 35 are hospitalized. One of the firemen reported: "Pipelines, storage tanks – the whole place seemed like it was on fire. There were cylinders as big as a freight car flying through the air for a couple of hundred yards. . . The cloud was like a mushroom, with drums popping all over the place, a very black and high funnel, hundreds of feet into the sky."

RIVERSIDE, CALIFORNIA (1978) – Erosion of the retaining dam for the Stringfellow Waste Pits threatens an 8-million gallon torrent of waste material, including DDT, nickel, lead, chloroform, and trichloroethylene. Heavy rains force the State to authorize a controlled release of 800,000 gallons of waste water to prevent further waste pool overflow and massive releases. Children and animals cavort in the discharge before it flows into the Santa Ana River. One parent tells the *Los Angeles Times*, "One of my kids came home and her boots fell apart after she played in that stuff."

TOONE, TENNESSEE (1978-79) – Residents file a class action suit against a chemical company that disposed of pesticide wastes in a landfill. Six years after the landfill is closed, the drinking water is found contaminated and the City of Toone is required to provide an alternative water supply to residents living within a three-mile radius.

Love Canal grabbed the Nation's attention, but it was not alone.

In 1979, EPA estimated that there were thousands of inactive and uncontrolled hazardous waste sites in the United States that could pose a serious risk to public health.

Hazardous waste disposal sites were only one part of the problem. Chemical spills posed another danger. Thomas C. Jorling, EPA's top official for waste management, told a Senate committee in 1979:

Spills of hazardous substances can have serious environmental and public health impacts similar to abandoned hazardous waste disposal sites. Environmental damage resulting from such spills can result in massive fish kills, destruction of wildlife, air pollution, and loss of livestock by contamination of drinking water. Spills have also resulted in loss of life and posed direct threats to human health from toxicity, fires, and explosions.

Need for New Legislation

On April 22, 1980, the Nation celebrated the 10th anniversary of Earth Day. Thousands took to the streets to reaffirm the country's commitment to protecting the environment. But the celebration was tempered by an event that took place the previous evening.



Oil pond at Bridgeport Rental and Oil Services site in New Jersey



Abandoned chemical warehouse in Elizabeth, New Jersey

"For decades, we have been disposing of these chemicals without adequate safeguards. We've paid very little attention to where these wastes have gone, in part because we weren't aware, and in some cases out of ignorance, and in some instances out of sheer carelessness."

Douglas M. Costle
EPA Administrator

Elizabeth, New Jersey (April 21, 1980) – An explosion in a warehouse ignites a fire that burns 24,000 barrels of chemicals, including illegally stored toxic wastes. The fire burns for 10 hours – sending a thick black plume of smoke and ash over a 15-square mile area and raising fears of widespread chemical contamination. The site is completely destroyed and there are reports of burning waste drums launching 200 feet through the air and bursting into cascades of flashing light. Public schools in Elizabeth, Linden, and Staten Island are ordered closed as State authorities urge residents to shut all doors and windows and remain inside. A 72-hour ban on commercial and sport fishing, covering a 40-mile radius, is also imposed.

In an April 23 editorial, the *New York Times* commented that the 10th anniversary of Earth Day "got off to a poisonous start" because of the fire in Elizabeth, New Jersey, but that "it, more than any other Earth Day observance, focused attention on the problem of getting rid of toxic wastes." The *Times* further commented that "[t]he dump in Elizabeth is one of those 'ticking time bombs' that environmental officials keep warning us about" and that the accident in New Jersey underscores "the need for long-pending Federal legislation to provide a 'super-fund' for cleaning up hazardous waste sites whose owners can't be found or who shirk responsibility." The *Times* editorial ended by warning, "The Elizabeth site was one of the worst. It is by no means one of a kind."

By 1980, the decades-old legacy of industrial waste was clearly presenting the Nation with a major problem. EPA's Thomas C. Jorling declared the Carter Administration's position that, "[r]eleases of hazardous wastes from abandoned and inactive disposal sites are perhaps the most serious environmental problem facing the Nation today." Campaigning for the Presidency, Senator Edward Kennedy (D-Massachusetts) called the disposal of hazardous waste "a public health nightmare of extraordinary dimensions" causing millions of Americans to take "unwitting, involuntary but potentially serious health risks every day, simply because of where they live."

Although the problem was serious, in 1980, the country had few means to address it. Individuals could sue in court for injuries suffered from industrial wastes, but this was costly and time-consuming – and awards were uncertain. More important, any remedy was after-the-fact. The common law did not provide a means to prevent hazardous waste injuries from happening in the first place.

Some of the Federal legislation passed in the wake of the first Earth Day helped to fill this gap – but only partially. RCRA provided EPA with authority to sue owners of inactive hazardous waste sites to prevent “an imminent and substantial danger to human health or the environment.” However, this required EPA to identify a person or business in the position to stop a spill from happening. Since many of the sites had been abandoned long ago, such an individual or business often could not be identified. The Clean Water Act established a control program for certain spills of oil and hazardous substances, but this was limited to discharges into navigable waters. The Clean Water Act did not cover spills of hazardous substances onto soils – and only certain designated hazardous substances could be regulated.

Congress Creates a “Superfund” to Deal with Hazardous Wastes

The range of problems explored by Congress was addressed by Senator Robert Stafford (R-Vermont) when the Environment and Public Works Committee held its first hearing in 1979 on the possible dangers posed by toxic waste sites:

If these hearings were to deal only with Love Canal or Toone, Tennessee, we would be neglecting the radium sites in Denver. And if we were to deal with the Denver sites as well, we would still be neglecting PCBs in the Hudson River and PBBs in Michigan. If we restrict ourselves to just waste, we will leave a large gap because in the chemical business one man’s meat is literally another man’s poison. Waste from one company is feedstock to another. What we must explore is the entirety of how and why toxics are entering the environment, whether they are injuring people, and if so, how. Then we must decide whether there should be a scheme to compensate victims, and if so, for what injuries.

The Senate Environment and Public Works Committee held 11 days of hearings in 1979. In the House, two separate committees held hearings and proposed separate bills for dealing with different aspects of the larger hazardous substances problem. On September 19, 1980, after often-contentious negotiations, the House passed a bill proposing a “superfund” to deal primarily with chemical emergencies.

The Senate meanwhile developed its own “superfund” bill to deal with emergencies, but which also allowed injured parties to sue in Federal court for damages. This bill languished in the

“People at Love Canal were driven from their homes. In Pittston, PA, people lived for days with the fear of breathing cyanide gas. In Youngsville, PA, PCB contaminants have infiltrated the soil about 100 yards from that town’s water supply. There are thousands of Love Canals, Pittstons, and Youngsvilles all over America.”

Senator John Heinz (R-Pennsylvania)



Workers move drums of toxic waste

MORE ON CERCLA'S DEFINITIONS

"RELEASE"

What's Included: "[A]ny spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment."

What's Excluded: Releases related to workplace-related incidents, nuclear incidents, motor vehicle exhaust emissions, and agricultural activities. These types of releases are covered by other laws.

"HAZARDOUS SUBSTANCE"

What's Included: CERCLA defines hazardous substances by referring to other environmental statutes and includes under the definition: "hazardous waste" under RCRA; "hazardous substances" and "toxic pollutants" under the Clean Water Act; hazardous air pollutants under the Clean Air Act; and imminently hazardous chemical substances under TSCA.

What's Excluded: Petroleum and natural gas.

"POLLUTANT OR CONTAMINANT"

What's Included: CERCLA's definition is broad and includes any substance that "may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations."

What's Excluded: Petroleum and natural gas.

Senate until after the 1980 Presidential elections. In November, Senator Stafford introduced an amended proposal. It was a version of this proposal that was eventually enacted.

On December 11, 1980, President Jimmy Carter signed the new Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund). Calling it "landmark in its scope and in its impact on preserving the environmental quality of our country," President Carter stated that it "fills a major gap in the existing laws of our country."

NEW AUTHORITIES PROVIDED BY CERCLA

If there was such a thing as a "truth in labeling" requirement for statutes, Superfund would be one law that would meet it. For (as passed by Congress in 1980 and strengthened by amendments in 1986), CERCLA is truly a:

- Comprehensive
- Environmental Response
- Compensation, and
- Liability Act.

Comprehensive Coverage of Toxic Waste Threats

Congress recognized that the problem was broad – and that broad solutions had to be created. Love Canal showed what could happen with the improper disposal of chemical wastes, but the issue was bigger than that. As stated by a 1980 Senate Environment and Public Works Committee report:

When confronted with an incident of toxic chemical contamination, it is often difficult to distinguish whether it is the result of a spill, a continuing discharge, an intentional dumping, or a waste disposal site. Any legislative solution would also have to address, in addition to disposal sites, the closely related problems of spills and other releases of dangerous chemicals which can have an equally devastating effect on the environment and human health.

Therefore, CERCLA provides comprehensive authority for the government to act. EPA can respond to:

- A "release" or "substantial threat" of a release of a "hazardous substance" into the environment; or
- A "release" or "substantial threat" of a release of "any pollutant or contaminant which may present an imminent and substantial danger to public health or welfare."

“Release” includes virtually any situation where a hazardous substance is released from its normal container. “Substantial threat of release” is even broader, allowing EPA to respond in situations like corroding tanks or abandoned drums, where there is even a risk of “release.”

Environmental Responses to Toxic Waste Threats

EPA may respond to an actual or potential release of any quantity of a “hazardous substance” or “pollutant or contaminant” in two general ways:

- Removals; or
- Remedial actions.

Removals deal primarily with environmental emergencies – and are generally short-term actions to diminish the threat of a release. Examples include cleaning up waste spilled from a container, building a fence around a site, or providing fresh water to residents whose regular water supply has been contaminated.

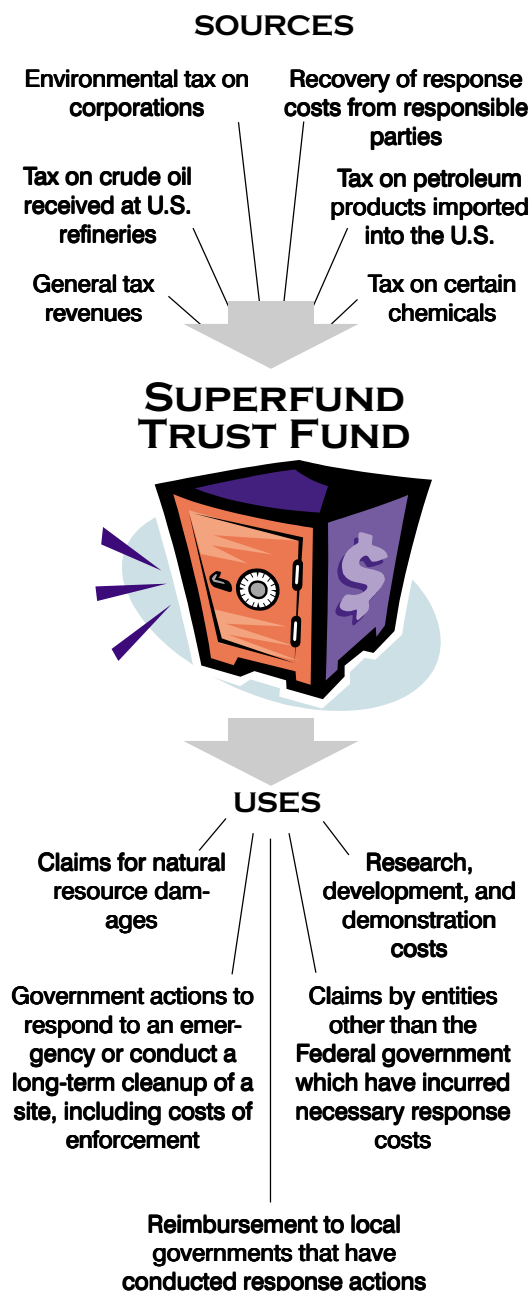
Remedial actions are long-term, permanent cleanups. Examples include excavating waste and transporting it to a facility that can safely handle it, treating the waste to remove contaminants, or placing clay covers over or barriers around the waste to prevent migration. Remedial actions may take many years and cost millions of dollars, in order to make the site safe for human health and the environment.

Compensating for Response Actions

Most of the 1980 press coverage about the passage of CERCLA concentrated on the Superfund Trust Fund, which gave the statute its nickname. The Trust Fund is financed from various taxes and court awards from the parties found responsible for hazardous substances releases. The 1980 law authorized a Trust Fund of \$1.6 billion. The 1986 amendments to CERCLA increased this amount to \$8.5 billion.

The Trust Fund can be used to address both emergencies and longer-term cleanups. It can pay for both actual cleanup costs and for EPA’s enforcement actions. It also is available to pay for certain natural resource damages, reimbursement of local governments, and claims by private parties.

Many times, the Trust Fund provides financing so EPA can address a hazardous substance release first, rather than have to wait for a court to determine who was responsible for causing the release. Later, when the court determines who is liable, EPA recovers its response costs and the Trust Fund is reimbursed. This is one of the major innovations of CERCLA since, prior to



WHY THE RESPONSIBLE PARTY PAYS UNDER CERCLA

Congress wanted to minimize the time spent in litigation – and instead concentrate those resources to actually clean up toxic waste sites. That is why CERCLA contains strong enforcement provisions and why liability under CERCLA is “strict,” “retroactive,” and “joint and several.” Here is a short explanation of these legal terms:

STRICT LIABILITY - In many cases, a plaintiff in an injury suit needs to prove that the defendant is “at fault” before a court will award damages (*e.g.*, that the defendant is negligent or acted in bad faith). This would be difficult in many Superfund cases because (as in the Love Canal example) wastes may have been deposited decades ago, and the records and memories of witnesses are often old and sketchy. In CERCLA, the plaintiff only needs to prove that the defendant is one (or more) of the four entities defined as liable by the statute. Those entities are:

- Former owners and operators of a vessel or facility;
- Current owners and operators of a vessel or facility;
- Persons who arranged for the disposal or treatment of hazardous substances; or
- Transporters of hazardous substances who selected the site for disposal or treatment.

Therefore, under CERCLA strict liability, the government only needs to prove that the defendant falls within one of these four entity categories – not that the defendant acted incorrectly. The reasoning is that the release caused injury to human health or the environment – and the entities that created the hazardous wastes should pay for cleaning up the release. Otherwise, the cost would be borne by the taxpayers.

RETROACTIVE LIABILITY - To use the Love Canal example again, all the waste was dumped long before CERCLA was passed in 1980 – but the “release” of that waste was current and causing injury after the statute was enacted. Retroactive liability means that parties found responsible for causing a release are liable even if their actions occurred prior to CERCLA’s enactment. Congress intended that the parties who were responsible for creating the problem should also be the parties who pay for cleaning it up – whether those actions occurred before CERCLA or not.

JOINT AND SEVERAL LIABILITY - At Love Canal, Hooker Chemical and Plastics (now Occidental Chemical Corporation) owned the site in the 1940s and early 1950s, and was responsible for a large portion of the wastes. However, the landfill was also used by other parties (*e.g.*, the City of Niagara Falls). As with most Superfund sites, the wastes came from different sources and resulted in an indivisible “toxic soup.” Under joint and several liability, each PRP is potentially liable for the whole cost of cleanup, and it is the responsibility of the PRPs to allocate “shares” of liability among themselves. This assures that the PRPs, not the innocent public, will bear the risk of any uncertainty over who is responsible for which part of the harm.

the statute’s enactment, the common law required that liability be determined first before any action could be taken.

Finding Liability for Releases

EPA has three basic options when it responds to a release:

- Conducting the cleanup itself using money from the Trust Fund and then seeking to recover its costs from the potentially responsible parties (PRPs);
- Compelling the PRPs to perform the cleanup through administrative or judicial proceedings; or
- Entering into settlement agreements with PRPs that require them to clean up the site or pay for cleanup.

In all cases, the responsible party pays since CERCLA provides EPA with strong enforcement authorities. Congress decided that the parties who created these sites should be the ones who pay for cleaning them up.

A SERIES OF FIRSTS

EMERGENCY CLEANUP BY NEW SUPERFUND PROGRAM AT THE “VALLEY OF THE DRUMS”

Bullitt County, Kentucky (1981) — EPA responded under its newly established Superfund Program, to a waste disposal site discharging pollutants into a tributary of the Ohio River. After inspecting the site formerly owned by A.L. Taylor, EPA discovered that ground water, surface water, and soils were polluted with heavy metals, volatile organic compounds, and plastics from spills and approximately 4,000 deteriorating and leaking waste drums which had accumulated over a 10-year period. With an expenditure of \$400,000 from the Superfund, EPA responded on behalf of approximately 100 residents, who lived within a one-mile radius of the site and were at risk of exposure. Through response actions and voluntary removal of wastes by known generators, the drums were removed and an interceptor trench installed, halting runoff into a nearby creek.

In 1983, EPA added the Valley of the Drums to a newly-established list of sites needing priority attention. In 1987, EPA began a long-term cleanup, including installation of a clay cap, a perimeter drainage treatment system and monitoring wells. Operation and maintenance of the remedy was turned over to the Kentucky Department of Natural Resources and Environmental Protection. In 1996, EPA removed the site from its priorities list.

Congress passed a Superfund statute, but it was up to EPA to create a Superfund program.

Because of national media attention on the problems at Love Canal, the Valley of the Drums, and other high profile sites, immediate and effective action was expected of EPA. Drums had to be collected and removed. Fires extinguished. Leaks from tanks and waste ponds stopped.

But responding to spills was not enough. EPA needed to clean up sites so they would continue to be safe in the future.

In order to make the Superfund program effective for the long-term, a large investment of resources was needed. EPA had to create a regulatory framework to carry out the mandate of Congress. This had to be done even though EPA faced a series of unknowns. The health effects of chemicals needed to be researched. Technologies had to be created to safely treat, store, and dispose of wastes. There was a general lack of data about specific sites – coupled with a fledgling scientific understanding of waste migration. There also was a shortage of trained personnel, such as engineers, to address these problems.

Nothing like Superfund had ever existed before. Over time, a strong and effective program evolved to protect human health and the environment from the dangers of hazardous wastes.



“Valley of the Drums”

THE CHALLENGE OF SUPERFUND IN 1980

- Determining the number of sites where potentially significant contamination existed;
- Assessing who was responsible for the waste;
- Developing a structure to enforce CERCLA;
- Determining the contaminants and the quantities dumped;
- Researching whether the contaminants were migrating away from the dump sites (and in what concentrations, in what directions and how far);
- Calculating the actual human exposure to contaminants and the potential health risks of such exposure; and
- Creating technologies to remove or control contaminants.



Chemical fire requiring emergency response

ASSESSING THE HAZARDS

When EPA's head of waste management, Thomas C. Jorling, testified before Congress in the wake of Love Canal, he admitted that his testimony was based on "very rough data." A lack of definitive data was a theme reiterated in both the House and Senate reports that accompanied the passage of CERCLA. There was enough information available to know that releases of hazardous substances were a serious problem that needed to be addressed – but beyond that, there were major gaps in understanding.

At the inception of EPA's Superfund program, there was much to be learned about industrial wastes and their potential for causing public health problems. Before this problem could be addressed on the program level, the types of wastes most often found at sites needed to be determined, and their health effects studied. Identifying and quantifying risks to health and the environment for the extremely broad range of conditions, chemicals, and threats at uncontrolled hazardous waste sites posed formidable problems. Many of these problems stemmed from the lack of information concerning the toxicities of the over 65,000 different industrial chemicals listed as having been in commercial production since 1945. This lack of knowledge challenged program development and slowed site cleanup.

Assessing the health effects of chemicals became the responsibility of the Agency for Toxic Substances and Disease Registry (ATSDR), which was established by CERCLA. ATSDR's mission was to provide emergency care and testing of persons exposed to toxic chemicals, maintain registries (or long-term health records) of these exposed persons, and establish a data bank of the hundreds of known toxic materials.

DEVELOPING TECHNOLOGIES

In addition to developing a better understanding of chemical hazards, the Nation had to develop new technical capabilities for assessing, and then treating or containing wastes. EPA had little experience with complex cleanups at large toxic waste sites prior to Superfund. Very little was known about exactly how to proceed in preventing the spread of these contaminants into the environment. Technologies had to be created to:

- Assess the problem;
- Collect the wastes;
- Treat the wastes so that the contaminants presented less of a threat;

- Dispose of the wastes in ways that were safe from additional exposure; and
- Ensure the safety of the hazardous waste workers.

CREATING THE REGULATORY STRUCTURE

The framework was established by Congress, but the actual mechanisms for implementing CERCLA were the responsibility of EPA. For example, at the Valley of the Drums site, EPA was able to respond quickly under the new Superfund statute to the immediate threat posed by the leaking drums, but it took the creation of a Superfund program to clean up the site so it was safe for the long-term.

One of the biggest questions that EPA needed to answer in order to prepare the regulatory framework for Superfund was: “How clean is clean?” In other words, at what level was a cleanup considered protective of human health and the environment?

EPA created three major regulatory mechanisms under Superfund to establish cleanup standards and procedures. They are: the National Contingency Plan (NCP), the Hazard Ranking System (HRS), and the National Priorities List (NPL). EPA has revised these three mechanisms over the years based on new understandings on how best to protect human health and the environment. They still remain the foundation of how EPA responds to a hazardous substance release.

The National Contingency Plan

The NCP is the primary regulation dictating CERCLA response actions. The NCP sets forth detailed procedures to be followed by EPA, the States, and private parties in selecting and conducting emergency removals and long-term cleanup actions.

The Hazard Ranking System

EPA developed the HRS to evaluate the environmental hazards of a site. The HRS is a numerically-based screening system that uses information from initial, limited investigations to assess the hazards a site poses to human health and the environment.

The HRS is designed to estimate the potential risks presented by releases or threatened releases of hazardous substances, pollutants, or contaminants at one site compared to those presented by other sites. The calculation of the HRS score analyzes potential “pathways” of exposure to human population or a sensitive environment. Each release, or potential release, is analyzed based

SUPERFUND SUCCESSFULLY RESPONDS IN TIMES BEACH

The Town of Times Beach, Missouri, captured the Nation’s attention in 1982, when EPA, acting upon recommendations from the U.S. Centers for Disease Control, closed down the town after discovering dangerous levels of dioxin. Roads to the town were blocked off, and the site was patrolled around-the-clock by security guards. The contamination occurred because the town sprayed dioxin-contaminated waste oil on streets and parking lots to control dust.

Times Beach was one of the most extensive cleanups in Superfund history. In 1983, EPA added the site to the first NPL. After the site was listed, EPA permanently relocated more than 2,000 people and tore down all of the homes and businesses.

Cleaning the Times Beach Superfund site was a massive effort that included installation of a temporary incinerator to burn the contaminated soil and the erection of a 15-foot high barrier around the incinerator to protect it from regular flooding by the Meramec River. By the end of 1997, cleanup of the site was completed by EPA and Syntex Agribusiness, the company that assumed responsibility of the site’s cleanup. More than 265,000 tons of dioxin-contaminated soil from the site and 27 nearby areas had been cleaned.

EPA and the State of Missouri worked closely with Syntex during cleanup to ensure that the restoration made the site suitable for productive use. In 1999, a new 500-acre State park commemorating the famous Route 66 opened on what was once one of the most recognized sites in the country. Thousands of visitors now enjoy the scenic riverside area in Missouri once known as Times Beach.

REGULATIONS FOR DISPOSAL OF HAZARDOUS WASTE

While CERCLA provides authorities for responding to hazardous waste releases, the authority for the treatment, storage, or disposal of those wastes is found in the Resource Conservation and Recovery Act (RCRA).

In 1984, Congress updated RCRA through the Hazardous and Solid Waste Amendments (HSWA), which prohibited land disposal of certain hazardous wastes at new and existing landfills, and at any other facility responsible for the treatment, disposal, or storage of hazardous waste. Under EPA's regulations, disposal site operators are responsible for the wastes for 30 years following site closure, and ground water monitoring is required at all disposal sites. However, many of those facilities that recycle their waste will be exempt from the requirements because EPA wants to encourage reuse of waste over waste burial.

With the passage of HSWA, Congress created authority for EPA's Land Disposal Restrictions (LDR) program. The LDR program requires that protective treatment standards be met to ensure that toxic components of hazardous waste are properly treated prior to land disposal.



Abandoned drums containing hazardous waste

on exposure from pathways such as ground water, surface water, air, and soil exposure.

The National Priorities List

The HRS score is the primary method for determining placement on the National Priorities List (NPL). The NPL identifies the sites that are national priorities for receiving further investigations and long-term cleanup actions. The first NPL was announced in 1983, with 406 priority sites identified. One of those sites was the Valley of the Drums. Because it was on the NPL, the site qualified for a Superfund-financed remedial action – and today, the “Valley of the Drums” is remembered mainly for historical reasons since the area is no longer the location of leaking drums and is safe for humans and the environment.

The NPL is updated regularly based on the evaluation of both new sites and the progress of cleanup at sites already on the NPL. As of October 2000, there are 1,450 sites on the final NPL – with 59 additional sites proposed for inclusion. Over the years, in addition to completing remedial construction at over 750 sites, EPA has deleted 219 sites from the NPL. Developing and maintaining the NPL requires close coordination among EPA and State agencies.

STRENGTHENING THE STATUTORY AUTHORITY

In 1986, Congress passed the Superfund Amendments and Reauthorization Act (SARA) to strengthen CERCLA authorities.

Based on EPA's experiences in implementing Superfund, Congress determined that the scope of hazardous waste sites was far larger and the sites' associated problems were much more complicated than originally anticipated. To provide more authority to handle these problems, Congress made major changes to strengthen the cleanup and enforcement processes. Congress also stressed the importance of permanent remedies and innovative treatment technologies, and increased the size of the Trust Fund from \$1.6 billion to \$8.5 billion.

One of the key provisions of SARA was the creation of a stronger mechanism for public participation. Because site remediation can have significant effects on communities, SARA required public participation activities throughout the Superfund process and provided authority for EPA's community right-to-know program. SARA also required State involvement at every phase of the Superfund program.

SARA contained many provisions to strengthen EPA's enforcement authority and thereby speed up the pace of cleanups. One of the major changes was to encourage voluntary settlements instead of litigation. This provided the basis for EPA's "Enforcement First" policy, which has resulted in more sites being cleaned up by the responsible parties instead of by EPA using the Trust Fund. Also new with the SARA amendments was the requirement that facilities owned or operated by the Federal government comply with CERCLA in the same manner and to the same extent as any non-governmental entity.



Training for emergency response

PREVENTING AND PREPARING FOR CHEMICAL EMERGENCIES AND TERRORIST ACTS

In the early hours of December 3, 1984, toxic gas leaked from a chemical plant in Bhopal, India killing 3,800. A year later, a smaller leak from a pesticide plant in Institute, West Virginia injured plant personnel and local residents –showing that the United States was not immune to a serious chemical industrial accident.

In 1986, Congress passed the Emergency Planning and Community Right-To-Know Act (EPCRA) as Title III of SARA. EPCRA requires public records of chemicals managed at a facility, and provides EPA with authority to work with States and communities to prevent accidents and develop emergency plans in case of dangerous releases of chemicals.

EPA works with the Federal Emergency Management Agency (FEMA) and 15 other Federal agencies to respond to national environmental emergencies. After the 1995 bombing of a Federal building in Oklahoma City killed 168, EPA supported the Nation's effort to plan for prevention and preparedness of chemical, biological, and nuclear releases due to terrorist acts. EPA also provides technical advice to foreign countries facing major environmental emergencies.

FINDING THE RESPONSIBLE PARTIES LIABLE IN COURT

CERCLA provided strong authorities to make the responsible parties pay for cleanup. But EPA and the Department of Justice had to create a structure to enforce those provisions and develop a body of legal precedent in the Federal courts. One of the first major cases under CERCLA was United States v. Monsanto, involving the South Carolina Recycling & Disposal, Inc. site (a.k.a. "Bluff Road") in South Carolina.

A complaint was brought against the site owners prior to the enactment of CERCLA, under a provision of the Resource Conservation and Recovery Act, to restrain an imminent and substantial endangerment to health or the environment. In 1981, notices were sent under CERCLA to the potentially responsible parties (PRPs), and a settlement was reached with some of the PRPs in 1982. Later that year, the United States brought suit against the non-settling PRPs, and the chemical industry picked the Bluff Road site as the test case for challenging CERCLA's liability provisions.

Both the United States district court and the Fourth Circuit Court of Appeals confirmed CERCLA's liability provisions, most particularly that responsible parties could be found retroactively liable for actions that took place before CERCLA was enacted, and that each responsible party was jointly and severally liable for the entire cost of a Superfund cleanup.

The settlers are responsible for cleaning up the Bluff Road site. This is standard practice now, but Bluff Road represents the first time this was done. What's more, the Monsanto court precedent has been crucial for later successful enforcement actions under CERCLA.

